

ABSTRACT

In a hierarchical tree-based protection scheme, a node in a mesh network is designated as a root node of a spanning hierarchical protection tree and subsequently invites each adjacent node to become its child within the tree. If the inviting node provides a more capacious protection path to the root node than is currently enjoyed by the invitee, the invitee designates the inviting node as its primary parent and assumes a new tree position. Otherwise, the invitee designates the inviting node as a backup parent. A node assuming a new tree position invites all adjacent nodes except its parent to become its child. The invitations propagate throughout the network until a spanning hierarchical protection tree is formed. Upon a subsequent failure of a straddling link, the tree may be used to re-route data. Further, given a tree link failure, protection switching is quickly achieved at a disconnected node through use of a backup parent as the new primary parent. Dynamic tree reconfiguration in the event of network topology changes may be limited to the network area surrounding the change.